

Repeated measures of psychological change in residential clients of an alcohol and drug treatment program

John Nolan (forensicspsych@midcoast.com.au)

Port Macquarie Psychology

Anthony Thompson (athompson@csu.edu.au)

School of Humanities & Social Sciences

Faculty of Arts Charles Sturt University

Abstract

A repeated measures design was used to evaluate changes in psychological and motivational characteristics for 80 adult male clients in a residential substance abuse program. Between group comparisons were also made for (n=42) clients mandated into treatment and those (n= 38) who entered treatment voluntarily. The main results showed significant improvement in psychological symptoms after 35 days and again after 75 days. These group effects were mirrored at the individual level by reliable change indices. The pattern of changes was similar for mandated and voluntary clients. Measures of motivation and interpersonal empathy did not change over time. This program evaluation study supports the integration of mental health treatment and substance abuse rehabilitation.

Substance Abuse Disorder is the repeated and compulsive abuse of substances, which typically results in gross unreliability, physical risks, legal problems and interpersonal conflict (American Psychiatric Association, 1994). Research has found that 57% of prison inmates had been using illicit drugs before being remanded. Furthermore, illicit drug abuse is linked to criminal offending due to effects of drugs on normal inhibition and the need to finance drug habits (Riddell, Nielsens, Butler, MacDonald Christie & Starmer, 2006). In a study of NSW prisons, Riddell et al. (2006) found a high rate of amphetamine use by inmates prior to remand with associated high rates of psychotic symptoms. These presentations were linked to aggression and greater likelihood of offences associated with violence or obtaining money for drugs.

For those who criminally offend due to substance use, Australian courts have increasingly supported treatment diversion schemes as alternatives to gaol (Reilly, Scantleton, & Didcott, 2002). State governments have formally created diversion schemes such as MERIT (Magistrates early referral into treatment) that encourage Courts to engage offenders with related substance use problems as part of a therapeutic process

(Freeman, 2003; Reilly et al., 2002). It is argued that this new rehabilitative law constructively uses substance abuse treatment to support improvements in the psychological and physical well-being of offenders (Senjo and Liep 2001). Therefore, decision on how to evaluate the mental health outcomes of substance abuse treatment is an important question. An additional question, which was the focus of the current study, is a comparison of self-reported mental health improvements of mandated versus voluntary clients in the same residential setting.

To date there have been few outcome studies that compare mandated to voluntary clients in the same treatment setting (Simpson & Joe, 2004). In fact, some studies (e.g., Guydish, Werdegar, Sorensen, Clark, & Acampara 1998) excluded mandated clients because the researchers felt outcome findings may have been confounded due to differences in motivation for treatment.

This current study hypothesized that clients participating in the residential treatment program would as a group and individuals experience positive psychological and motivational changes over time. Prior observation suggested that a significant proportion of individuals became motivated towards therapeutic change during treatment despite mandated or voluntary status. It was therefore also hypothesised that those legally mandated into treatment would experience similar levels of psychological and motivational change as voluntarily admission clients.

Method

Participants

A sample of 80 adult males was recruited from a drug and alcohol residential rehabilitation centre in New South Wales. Typically, there were 35-50 residents involved in treatment at any one time and median length of stay was 78 days. Participant ages ranged from 19 to 63 years ($M = 34.10$, $SD = 9.50$) and 50% were mandated and 50% were voluntary admissions.

Self-reports indicated that 80% of participants used alcohol, 50% heroin and / or

amphetamines, and 81% cannabis. Thirty five percent reported recently dealing drugs. Nearly all participants described beginning their substance use from the ages of 12 to 14 years. Of the 80 participants, 71% were unemployed, 54% were on current police charges, 34% had a recent history of violent crime, 45 % identified as Indigenous Australians, and 63% had an unstable lifestyle prior to entering treatment. The mean years of education was 10.1 years with 5% informally assessed as being unable to read or write.

Materials

Demographic and drug use information

The Opiate Treatment Index (OTI; Darke, Ward, Hall, Heather, & Wodak, 1991) is a standardised instrument used widely in researching patterns of drug use. The OTI was only used to obtain demographic profiles of substance use and social consequences.

Negative emotional states

The Depression, Anxiety and Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995) is a 21 item set of three self-report scales developed to measure negative emotional states of depression, anxiety and stress using a Likert response format.

Psychological Symptoms

The Brief Symptom Inventory-53 (BSI; Derogatis, 1993) is a 53 item self-report instrument designed to screen for a broad range of psychological problems using nine symptom scales: 1) Somatization, 2) Obsessive-Compulsive, 3) Interpersonal Sensitivity, 4) Depression, 5) Anxiety, 6) Hostility, 7) Phobic Anxiety, 8) Paranoid Ideation and 9) Psychoticism. The nine subscales make up three global indices of which The Global Severity Index (GSI) is the overall measure of psychological distress calculated as the mean item response across all items (Jackson & Sher, 2003). The BSI has been widely used in substance abuse and mental health studies (Jackson & Sher, 2003).

Empathy

The Interpersonal Reactivity Index (IRI; Davis, cited in Bevan, O'Brien-Malone, & Hall, 2004) was used to measure aspects of empathy. It is available on the public domain with free access and consists of 28 items that assess cognitive and affective dimensions of empathy. On a Likert scale from 0 (not well) to 4 (very well), respondents describe how well their feelings are reflected by scenarios such as, "being in a tense

emotional situation scares me". In this study items related to interpersonal factors (Perspective Taking and Empathic Concern), were used.

Stages of Change

The Stages of Change Scales (SOCS; McConaughy et al. cited in Hemplill and Howell, 2000). The SOCS is a 32-item instrument derived from the Prochaska and DiClemente (1982) theory of how personal change occurs. There are four 8-item subscales: 1) Precontemplation refers to a resistance to change. 2) Contemplation refers to considering the need for change. 3) Action refers to recognition of a problem and the pursuit of a resolution. 4) Maintenance refers to application of skills acquired to prevent the problem re-emerging. To each item respondents indicate how they currently feel on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Procedure

Approval for the research was obtained from the University ethics committee and the Directors of the treatment centre. Ten to fifteen days after entering the program, male residents were asked to take part in the study and written informed consent obtained from participants. Data was at this time referred to as Time 1. At 35 – 40 days (Time 2) and 70 – 75 days (Time 3) after entry into treatment, participants who remained were again asked to complete the questionnaires. Time to complete all measures was 45 minutes initially and thereafter 30 minutes as demographic and substance use information was collected only at Time 1. Either the first author or an assistant collected the data for each client in one session.

Treatment was within the milieu of a therapeutic community. It combined a philosophy of reconnecting spiritual relationships with principles of Alcoholics Anonymous (AA) that included public speaking to share life stories. Other groups focused on addiction education. The first author in role of psychologist provided psycho-educational groups. Addiction therapists provided personal counselling as required to assist clients to focus on their treatment program.

Results

Data screening and analysis

The dependent variables for this study were scores obtained on the BSI, DASS, SOCS and the IRI. These measures were examined for two sub-samples of participants (mandated versus

voluntary) in three successive data collection times spanning 75 days in the treatment program.

Time 1 results

The descriptive data was combined for the mandated and voluntary sub-samples because a series of Multivariate Analysis of Variance (MANOVA) on subscale scores with group membership (mandated versus voluntary) as a fixed factor, revealed only one significant effect. This effect occurred for the Stages of Change subscales, $F(4,75) = 3.00$, $p = .02$, Wilks' Lambda = .86. Follow-up univariate analyses showed that the mandated sub-sample scored higher ($M = 18.95$ and $SD = 7.38$) than the voluntary subsample ($M = 14.89$ and $SD = 5.30$) on the "Precontemplation" subscale $F(1,78) = 7.82$, ($p < .01$). With that exception, the mandated and voluntary subgroups were not distinguishable on the various dependent measures.

Data from Time 1 were compared with normative data from various sources for the dependent measures using independent t tests. On the BSI summary indices and the DASS subscales the study sample had significantly higher scores than the normative sample scores in the magnitude of four times greater ($p \leq .01$). SOCS scores were similar except the current sample had a significantly higher mean score on the "Action" subscale ($p \leq .01$). The study sample showed less empathy than the normative sample for the IRI on both IRI subscales ($p \leq .01$). In summary, at 2 weeks into treatment (Time1) the participants of this study were, as a group, showing a broad range of psychological dysfunction symptoms.

Time 2 results

Twenty four participants (12 mandated, 12 voluntary) left in the first five weeks of treatment

leaving 56 participants (30 mandated, 26 voluntary) at time 2. The "stayers" and "leavers" were compared on the dependent measures collected at Time 1 using MANOVAs in which mandated versus voluntary admission was also a fixed factor. No overall significant differences were found. The "stayers" and "leavers" were demographically similar regarding employment, legal and Indigenous status as well as reported amphetamine, heroin, marijuana and alcohol use.

The data at Time 2 constituted a mixed between-within subjects design. The between subject factor was mandated versus voluntary status in the program and the within subject factor was data from the two time periods. A repeated measures ANOVA for dependent variables was performed. There were no significant interactions or differences between the mandated and voluntary groups and time on any measure. Table 1 shows means and standard deviations for the 56 "stayers" at Time 1 and Time 2. On each of the nine BSI subscales and the three DASS subscales there was a significant main effect for time (Wilks' Lambda from .507 to .751, $F(1,54)$ from 17.92 to 52.42, $p < .0005$). These changes in the direction of improvement are considered to be very large effect sizes (partial eta squared from .249 to .493). On the remaining measures for the SOC and IRI scales there were no significant effects.

Time 3 results

Eighteen participants (14 mandated, 4 voluntary) left after Time 2 and before Time 3 data were collected, leaving 38 participants (16 mandated, 22 voluntary) at Time 3. The "leavers" and "stayers" were compared on the dependent measures collected at Time 2.

Table 1. Descriptive Statistics on Dependent Measures for Sample (N=56) at Time 1 and Time 2

Measure	Time 1		Time 2	
	M	SD	M	SD
Brief Symptom Inventory				
Somatization.	1.30	0.95	0.58	0.52
Obsessive compulsive	1.92	1.14	1.14	0.88
Interpersonal sensitivity	1.72	1.01	1.00	0.76
Depression	1.55	1.06	0.79	0.79
Anxiety	1.45	0.99	0.78	0.73
Hostility	1.23	0.99	0.78	0.77
Phobic anxiety	0.93	0.91	0.48	0.72
Paranoid ideation	1.56	0.92	0.97	0.70
Psychoticism	1.52	0.96	0.89	0.73
Global severity index	1.44	0.84	0.85	0.68

Positive symptoms of distress	2.00	0.84	1.39	0.52
Positive symptoms total	35.63	13.49	28.32	14.76
Depression Anxiety Stress Scale(DASS)				
Depression	16.85	11.50	11.57	9.56
Anxiety	14.50	9.87	8.68	7.96
Stress	19.27	10.31	13.39	9.69

Voluntary versus mandated status was not included as a fixed factor as numbers were small for the “leavers”. MANOVAs revealed no differences on the combined dependent measures for the two groups. The two groups were similar in demographic data regarding employment and indigenous status as well as reported amphetamine, heroin, marijuana and alcohol use. A Chi-square test for independence between “leavers” versus “stayers” (Time 2 to Time 3) and legal status (mandated versus voluntary) revealed significant association (χ^2 , continuity correction = 4.897, $p < .05$). There were proportionally more mandated participants among the “leavers” (77.7% of mandated in the 18) than among the “stayers” (42.1% in the 38).

Repeated measures ANOVAs (mixed-between-within subjects design) were performed to examine whether there were changes on the dependent measures from Time 2 to Time 3. The between subject factor was mandated versus voluntary status in the program. There were no significant interactions or differences between the mandated versus voluntary status and time on any measure. There were significant improvements on all BSI subscales except somatization and depression and significant improvements for the DASS depression and stress subscales (Wilks’ Lambda from .638 to .791, $F(1,36)$ from 9.50 to 20.42, $p < .01$). These changes are considered very large effect sizes (partial eta squared from .209 to .362). On the measures for the SOCS and IRI scales there were no significant effects and no significant categorical distinctions made between the positive motivational stages for the SOCS.

Reliable change

Reliable change indices (RCI) were used to determine whether statistically significant changes were clinically meaningful (Jacobson, Roberts, Berns, & McGlinchey, 1999). The RCI was calculated as the posttest score minus the pretest score divided by the standard error of difference and the index if larger than 1.96, represents reliable and improved change. In the current study RCIs were calculated for the BSI Global Severity Index and the three DASS subscales for changes across time periods. In

particular, results for Time 1 to Time 3 indicated that over eighty percent of the 38 participants who stayed longest in treatment had significantly improved.

Discussion

This study demonstrated significant and similar improvements in psychological symptoms for mandated and voluntary groups in residential substance abuse treatment over 75 days. Measures of active motivational stages and empathy did not change over time. The only difference between groups was that mandated clients were significantly higher on the pre-contemplation subscale than voluntary clients. This raises doubts about making distinctions between contemplation, action and maintenance as active stages of change. Engagement and retention rates are important factors in evaluating the effectiveness of residential programs and at three months treatment the highest retention rates are generally considered to be about 50% (Brunette, Mueser, & Drake, 2004). In this study, the dropout rate was 30% at Time 2 (24 of 80) and 54% by Time 3 (42 of 80). Investigating reasons why individuals leave substance abuse treatment could be a further study. A principle aim of this study was to develop a program evaluation model that quantified psychological and motivational changes during residential treatment. The findings are limited in that a control group was not used and therefore the effects of the treatment could not be differentiated from the effects of time in treatment. The changes observed in psychological improvement at least suggest that the residential treatment program may be beneficial. A study to investigate this would need a non-treatment control group or an alternative treatment comparison group. A further limitation is that the changes identified were not examined for sustainability post treatment. A study of those who chose to return to treatment may help to answer this question.

The study used quantitative method to provide good baseline data on one particular residential program. It also provided a platform

for further research with a comparison group and more specific measures of treatment components. For example, qualitative interviews for “stayers” to Time 3 may provide information on the relative effects of personal counselling or other factors that may have encouraged retention in treatment. Interviews of “returnees” to treatment may also assist treatment program development. For instance, an examination of client perceptions on

whether improved psychological health can be linked to lower rates of substance abuse and recidivism would be a valuable further study. Program evaluation is not a one-off study. It requires a commitment to ongoing and cumulative investment of applied research. Thus benefits should not only accrue to the clients but also to the criminal justice system, which should know more clearly the likely benefits for mandated referrals.